This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found here.

If you have a suggestion to make the keys better, please fill out the short survey here.

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

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1. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{8}{7}+\frac{4}{9}x>\frac{9}{6}x-\frac{8}{3}$$

The solution is $(-\infty, 3.609)$, which is option D.

A. (a, ∞), where $a \in [-5.25, -3]$

$(-3.609, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

B. (a, ∞), where $a \in [0.75, 6.75]$

$(3.609, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

C. $(-\infty, a)$, where $a \in [-4.5, -0.75]$

$(-\infty, -3.609)$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a)$, where $a \in [1.5, 7.5]$

* $(-\infty, 3.609)$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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2. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-10x-10 \geq 8x-8$$

The solution is $(-\infty, -0.111]$, which is option A.

A. $(-\infty, a]$, where $a \in [-0.63, -0.05]$

* $(-\infty, -0.111]$, which is the correct option.

B. $(-\infty, a]$, where $a \in [-0.05, 0.13]$

$(-\infty, 0.111]$, which corresponds to negating the endpoint of the solution.

C. $[a, \infty)$, where $a \in [-0.03, 0.27]$

$[0.111, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

D. $[a, \infty)$, where $a \in [-0.23, -0.1]$

$[-0.111, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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3. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

No more than 7 units from the number 6.

The solution is $[-1, 13]$, which is option B.

A. $(-\infty, -1] \cup [13, \infty)$

This describes the values no less than 7 from 6

B. $[-1, 13]$

This describes the values no more than 7 from 6

C. $(-1, 13)$

This describes the values less than 7 from 6

D. $(-\infty, -1) \cup (13, \infty)$

This describes the values more than 7 from 6

E. None of the above

You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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4. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-7 - 7x \leq \frac{-59x - 3}{9} < 5 - 8x$$

The solution is None of the above., which is option E.

A. $(a, b]$, where $a \in [12.75, 18.75]$ and $b \in [-8.25, -2.25]$

$(15.00, -3.69]$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

B. $[a, b)$, where $a \in [13.5, 16.5]$ and $b \in [-9, 2.25]$

$[15.00, -3.69)$, which is the correct interval but negatives of the actual endpoints.

C. $(-\infty, a] \cup (b, \infty)$, where $a \in [12, 15.75]$ and $b \in [-6, 0.75]$

$(-\infty, 15.00] \cup (-3.69, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

D. $(-\infty, a) \cup [b, \infty)$, where $a \in [13.5, 16.5]$ and $b \in [-6.75, -1.5]$

$(-\infty, 15.00) \cup [-3.69, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $[-15.00, 3.69)$.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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5. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{-7}{5} + \frac{3}{8}x \leq \frac{8}{7}x - \frac{8}{3}$$

The solution is $[1.65, \infty)$, which is option A.

A. $[a, \infty)$, where $a \in [-0.75, 3.75]$

* $[1.65, \infty)$, which is the correct option.

B. $[a, \infty)$, where $a \in [-5.25, 0]$

$[-1.65, \infty)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a]$, where $a \in [-4.5, 0.75]$

$(-\infty, -1.65]$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

D. $(-\infty, a]$, where $a \in [-1.5, 9]$

$(-\infty, 1.65]$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-7 + 7x > 8x \text{ or } -3 + 7x < 9x$$

The solution is $(-\infty, -7.0)$ or $(-1.5, \infty)$, which is option D.

A. $(-\infty, a) \cup (b, \infty)$, where $a \in [0, 5.25]$ and $b \in [3.75, 13.5]$

Corresponds to inverting the inequality and negating the solution.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-8.25, -4.5]$ and $b \in [-2.25, 4.5]$

Corresponds to including the endpoints (when they should be excluded).

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-1.5, 3.75]$ and $b \in [5.25, 8.25]$

Corresponds to including the endpoints AND negating.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-9.75, -5.25]$ and $b \in [-2.25, 1.5]$

* Correct option.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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7. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-3 + 3x < \frac{35x + 5}{5} \leq 4 + 6x$$

The solution is $(-1.00, 3.00]$, which is option D.

A. $(-\infty, a] \cup (b, \infty)$, where $a \in [-2.25, 0.75]$ and $b \in [-1.5, 3.75]$

$(-\infty, -1.00] \cup (3.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

B. $(-\infty, a) \cup [b, \infty)$, where $a \in [-1.65, 0.15]$ and $b \in [2.25, 9]$

$(-\infty, -1.00) \cup [3.00, \infty)$, which corresponds to displaying the and-inequality as an or-inequality.

C. $[a, b)$, where $a \in [-4.2, 0.67]$ and $b \in [-1.5, 6]$

$[-1.00, 3.00)$, which corresponds to flipping the inequality.

D. $(a, b]$, where $a \in [-5.25, 0]$ and $b \in [1.5, 6]$

* $(-1.00, 3.00]$, which is the correct option.

E. None of the above.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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8. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

Less than 7 units from the number -2.

The solution is $(-9, 5)$, which is option C.

A. $(-\infty, -9] \cup [5, \infty)$

This describes the values no less than 7 from -2

B. $(-\infty, -9) \cup (5, \infty)$

This describes the values more than 7 from -2

C. $(-9, 5)$

This describes the values less than 7 from -2

D. $[-9, 5]$

This describes the values no more than 7 from -2

E. None of the above

You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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9. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$5 + 3x > 5x \text{ or } 6 + 7x < 8x$$

The solution is $(-\infty, 2.5)$ or $(6.0, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-1.5, 3.75]$ and $b \in [1.5, 9.75]$

Corresponds to including the endpoints (when they should be excluded).

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-8.25, -1.5]$ and $b \in [-3.75, 0.75]$

Corresponds to including the endpoints AND negating.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-0.75, 3.75]$ and $b \in [3.75, 6.75]$

* Correct option.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-7.5, -1.5]$ and $b \in [-3.75, 0.75]$

Corresponds to inverting the inequality and negating the solution.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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10. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$4x - 3 \geq 9x - 6$$

The solution is $(-\infty, 0.6]$, which is option D.

A. $[a, \infty)$, where $a \in [-0.56, 1.55]$

$[0.6, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

B. $[a, \infty)$, where $a \in [-0.75, -0.54]$

$[-0.6, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

C. $(-\infty, a]$, where $a \in [-1.4, 0.2]$

$(-\infty, -0.6]$, which corresponds to negating the endpoint of the solution.

D. $(-\infty, a]$, where $a \in [-0.2, 4.4]$

* $(-\infty, 0.6]$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.
